UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,452	12/05/2000	Paulus Thomas Maria van Zeijl	29206-00027	8130

7590 09/25/2003

Stanley R. Moore, Esq.
Jenkens and Gilchrist, P.C.
3200 Fountain Place
1445 Ross Avenue
Dallas, TX 75202

EXAMINER	
MILLER, BRANDON J	
ART UNIT	PAPER NUMBER
2683	5

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/730,452	MARIA VAN ZEIJL, PAULUS THOMAS
	Examiner	Art Unit
	Brandon J Miller	2683

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 30 June 2003 .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-6,8-36 and 38-40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-6,8-36 and 38-40 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 .
4) ☐ Interview Summary (PTO-413) Paper No(s): _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6, 9-15, 17, 21-23, 25-26, 28-36, and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley in view of King.

Regarding claim 1 Ripley teaches an image reject circuit with a local oscillator for producing a local oscillator signal (see col. 5, line 21-22). Ripley teaches a tunable phase shifting network for receiving a local oscillator signal and producing an output in-phase signal (I) and an output quadrature (Q) signal (see col. 5, lines 23-26). Ripley teaches a phase detector for determining the phase of the output I signal and a phase detector for determining the phase of the output Q signal (see col. 3, lines 30-32 and col. 5, lines 27-30). Ripley teaches determining the difference between the phase of the output I and Q signals, to produce a tuning signal for tuning the phase shifting network to bring the difference between the phases of the output I and Q signals towards a desired level (see col. 3, lines 32-37). Ripley does not teach an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, or determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the

output I and Q signals towards a desired level. King teaches an amplitude detector for determining the amplitude of the output signals and determining the difference between the amplitude of output signals to bring the difference between the amplitudes of the output signals towards a desired level (see col. 3, lines 56-64 and col. 4, lines 1-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, and determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level because this would allow for adjustment of phase and/or amplitude of input signals provided for improving the image rejection.

Regarding claim 2 Ripley teaches a phase shifting network that has first and second input terminals for receiving the local oscillator signal (see col. 5, lines 34-38). Ripley teaches a first phase shifting circuit connected between a first input terminal and a voltage reference and a second phase shifting circuit connected between a voltage reference and a second input terminal (see col. 3, lines 24-26, 45-47 & 51-53). Ripley teaches a first and second pairs of complementary output lines connected to each of the first and second phase shifting circuits; and, a tuning input for receiving a tuning signal (see col. 5, lines 23-38).

Regarding claim 3 Ripley teaches each of a first and second phase shifting circuits comprises a bridge circuit, with each bridge circuit containing a first parallel arm and second parallel arm connected between the respective input terminal and the voltage reference; the first parallel arm comprising a resistive element connected in series with a capacitive element; the

second parallel arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50).

Regarding claim 4 Ripley teaches a tunable phase shifting network that is tuned by adjusting an RC time constant (see col. 4, lines 37-42).

Regarding claim 6 Ripley teaches a resistive element that comprises a variable resistor, which is tuned in accordance with a tuning signal (see col. 3, lines 15-16).

Regarding claim 9 Ripley teaches each of a first and second phase shifting circuits comprises a bridge circuit, with each bridge circuit containing a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley does not teach the first arm comprising a resistive element connected in series with an inductive element; the second arm comprising an inductive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and inductive element, or a phase shifting network that is tuned by adjusting the RL time constant. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include the first arm comprising a resistive element connected in series with an

inductive element; the second arm comprising an inductive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and inductive element, and a phase shifting network that is tuned by adjusting the RL time constant because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 10 Ripley teaches each of a first and second phase shifting circuits comprises a bridge circuit, with each bridge circuit containing a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley does not teach the first arm comprising an inductive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with an inductive element; and, each I and Q output line being connected to a respective junction between the series connected inductive element and capacitive element, or a phase shifting network that is tuned by adjusting the LC time constant. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include the first arm comprising an inductive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with an inductive element; and, each I and Q output line being connected to a respective

junction between the series connected inductive element and capacitive element, and a phase shifting network that is tuned by adjusting the LC time constant because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 12 King teaches two-stage amplitude detection (see col. 4, lines 6-19 and FIG. 2).

Regarding claim 13 King teaches amplitude detectors that include quadratic function circuits (see col. 4, lines 25-29).

Regarding claim 14 Ripley and King teach a device as recited in claim 1 except for a desired difference between the amplitudes of the output I and Q signals that is substantially zero. King does teach a desired difference between the amplitudes of the output I and Q signals (see col. 4, lines 10-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a desired difference between the amplitudes of the output I and Q signals that is substantially zero because this would allow for adjustment of phase and/or amplitude of input signals provided for improving the image rejection.

Regarding claim 15 King teaches removing any residual difference between the amplitudes for the I and Q signals (see col. 4, lines 12-17).

Regarding claim 17 King teaches a desired difference between amplitudes of the output I and Q signals that is set to a predetermined level, to compensate for amplitude error (see col. 4, lines 1-19).

Regarding claim 21 King teaches s tunable phase shifting network located in an intermediate frequency (see col. 2, lines 56-62).

Regarding claim 22 Ripley teaches an image reject circuit with a local oscillator for producing a local oscillator signal (see col. 5, line 21-22). Ripley teaches a tunable phase shifting network for receiving a local oscillator signal and producing an output in-phase signal (I) and an output quadrature (Q) signal (see col. 5, lines 23-26). Ripley teaches a phase detector for determining the phase of the output I signal and a phase detector for determining the phase of the output Q signal (see col. 3, lines 30-32 and col. 5, lines 27-30). Ripley teaches determining the difference between the phase of the output I and Q signals, to produce a tuning signal for tuning the phase shifting network to bring the difference between the phases of the output I and Q signals towards a desired level (see col. 3, lines 32-37). Ripley does not teach an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, or determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level. King teaches an amplitude detector for determining the amplitude of the output signals and determining the difference between the amplitude of output signals to bring the difference between the amplitudes of the output signals towards a desired level (see col. 3, lines 56-64 and col. 4, lines 1-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, and determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level because this would allow for

adjustment of phase and/or amplitude of input signals provided for improving the image rejection.

Regarding claim 23 Ripley and King teach a device as recited in claim 4 and is rejected given the same reasoning as above.

Regarding claim 25 Ripley and King teach a device as recited in claim 6 and is rejected given the same reasoning as above.

Regarding claim 26 Ripley teaches changing the capacitance value and the resistance value (see col. 4, lines 36-42).

Regarding claim 28 Ripley teaches a device as recited in claim 22 except for a phase shifting network that is tuned by adjusting an RL time constant. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include a phase shifting network with inductive elements that is tuned by adjusting an RL time constant because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 29 Ripley teaches a device as recited in claim 22 except for a phase shifting network that is tuned by adjusting an LC time constant. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include a phase shifting network with inductive elements that is tuned by adjusting an LC time constant because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 30 King teaches detecting the amplitudes of I and Q signals (see pg. 4, lines 1-19).

Regarding claim 31 Ripley teaches a phase shifting network located in an intermediate frequency path within the receiver, and tuning being performed according to the tuning signal (see abstract, col. 1, lines 64-67, and col. 2, lines 1-8).

Regarding claim 32 Ripley and King teach a device as recited in claim 14 and is rejected given the same reasoning as above.

Regarding claim 33 Ripley and King teach a device as recited in claim 17 and is rejected given the same reasoning as above.

Regarding claim 34 Ripley teaches a tunable phase shifting network for use in an image reject circuit (see col. 5, lines 23-26). Ripley teaches a phase shifting network that has first and second input terminals for receiving an input signal and producing an output in-phase (I) signal and an output quadrature (Q) signal (see col. 5, lines 34-38). Ripley teaches a first phase shifting circuit connected between a first input terminal and a voltage reference and a second phase shifting circuit connected between a voltage reference and a second input terminal (see col. 3, lines 24-26, 45-47 & 51-53). Ripley teaches containing a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley teaches a phase shifting network that is tuned by adjusting an RC time constant (see col. 4, lines 37-42). Ripley does not

the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal. King teaches the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal (see col. 3, lines 56-64 and col. 4, lines 1-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal because this would allow for adjustment of phase and/or amplitude of input signals provided for improving the image rejection.

Regarding claim 35 Ripley and King teach a device as recited in claim 5 and is rejected given the same reasoning as above.

Regarding claim 36 Ripley and King teach a device as recited in claim 6 and is rejected given the same reasoning as above.

Regarding claim 39 Ripley teaches a tunable phase shifting network for use in an image reject circuit (see col. 5, lines 23-26). Ripley teaches a phase shifting network that has first and second input terminals for receiving an input signal and producing an output in-phase (I) signal and an output quadrature (Q) signal (see col. 5, lines 34-38). Ripley teaches a first phase shifting circuit connected between a first input terminal and a voltage reference and a second phase shifting circuit connected between a voltage reference and a second input terminal (see col. 3, lines 24-26, 45-47 & 51-53). Ripley teaches containing a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive

element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley does not teach the first arm comprising a resistive element in series with an inductive element; the second arm comprising an inductive element connected in series with a resistive element; and, each I and Q output line being connected to respective junction between the series connected resistive element and inductive element, a phase shifting network that is tuned by adjusting the RL time constant, or the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). King teaches the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal (see col. 3, lines 56-64 and col. 4, lines 1-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include the first arm comprising a resistive element in series with an inductive element; the second arm comprising an inductive element connected in series with a resistive element; and, each I and Q output line being connected to respective junction between the series connected resistive element and inductive element, a phase shifting network that is tuned by adjusting the RL time constant, and the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal because this would allow for adjustment of phase and/or amplitude of input signals provided for improving the image rejection.

Regarding claim 40 Ripley teaches a tunable phase shifting network for use in an image reject circuit (see col. 5, lines 23-26). Ripley teaches a phase shifting network that has first and second input terminals for receiving an input signal (see col. 5, lines 34-38). Ripley teaches a first phase shifting circuit connected between a first input terminal and a voltage reference and a

second phase shifting circuit connected between a voltage reference and a second input terminal (see col. 3, lines 24-26, 45-47 & 51-53). Ripley teaches a first and second parallel arms connected between the respective input terminal and the voltage reference; the first arm comprising a resistive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with a resistive element; and, each I and Q output line being connected to a respective junction between the series connected resistive element and capacitive element (see col. 3, lines 11-21 & 46-50). Ripley does not teach the first arm comprising an inductive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with an inductive element; and, each I and Q output line being connected to a respective junction between the series connected inductive element and capacitive element, a phase shifting network that is tuned by adjusting the LC time constant, or the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal. Ripley does teach adjusting an RC time constant (see col. 4, lines 37-42) and changing resistive and capacitive elements (see col. 3, lines 18-21 and col. 5, lines 15-17). King teaches the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal (see col. 3, lines 56-64 and col. 4, lines 1-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Ripley adapt to include the first arm comprising an inductive element connected in series with a capacitive element; the second arm comprising a capacitive element connected in series with an inductive element; and, each I and Q output line being connected to a respective junction between the series connected inductive element and capacitive element, a phase shifting network that is tuned by adjusting the LC time constant, and the difference between amplitudes of the

output in-phase (I) signal and the output quadrature (Q) signal because this would allow improved image rejection capabilities of a phasing receiver.

Claims 5, 11, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley in view of King and Moore.

Regarding claim 5 Ripley and King teach a device as recited in claim 4 except for a capacitive element that comprises a reverse polarity junction diode, which is tuned in accordance with a tuning signal. Moore teaches a reverse polarity junction diode, which is tuned in accordance with a tuning signal (see pg. 7, lines 5-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Moore adapt to include a reverse polarity junction diode, which is tuned in accordance with a tuning signal because this would allow improved image rejection capabilities of a phasing receiver.

Regarding claim 11 Ripley teaches an input terminal for receiving an input signal (see col. 1, lines 62-66). Ripley teaches a resistor connected between an input terminal and an output terminal; and a capacitor connected between an output terminal and ground (see col. 3, lines 11-15 and FIG. 2). Ripley does not teach a resistor and a forward polarity diode connected between the input terminal and an output terminal; and, a capacitor connected between the output terminal and ground. Moore teaches a resistor and a forward polarity diode connected between an input terminal and an output terminal (see col. 7, lines 5-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a resistor and a forward polarity diode connected between the input terminal and an output terminal; and, a capacitor connected between the output terminal and ground because this would allow for improved image rejection capabilities of a phasing receiver.

Regarding claim 24 Ripley and King teach a device as recited in claim 22 except for changing the voltage across junction diodes, causing the capacitance of the junction diodes to change accordingly. Moore teaches changing the voltage across junction diodes, causing the capacitance of the junction diodes to change accordingly (see pg. 7, lines 5-7 & 10-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include changing the voltage across junction diodes, causing the capacitance of the junction diodes to change accordingly because this would allow for improved image rejection capabilities of a phasing receiver.

Claims 8, 16, 18-20, 27, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley in view of King and Mole.

Regarding claim 8 Ripley and King teaches a device as recited in claim 6 except for a MOFSET operated in its triode region. Mole teaches transistors operating in their triode region (see col. 12, lines 15-18 & 21-25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include a MOFSET operated in its triode region because this would allow for reduction in the impact of image frequencies generated by mixing.

Regarding claim 16 Ripley and King teach a device as recited in claim 15 except for an RC poly-phase filter section for removing any residual difference between the amplitudes of the I and Q signals. Mole teaches an RC poly-phase filter (see abstract and col. 4, lines 9-12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an RC poly-phase filter section for removing any residual

difference between the amplitudes of the I and Q signals because this would allow for a desired amplitude value to be set.

Regarding claim 18 Mole teaches bipolar technology (see col. 8, lines 42-44).

Regarding claim 19 Mole teaches circuitry that is implemented in CMOS, BiCMOS, SiGe or GaAs technology (see col. 13, lines 35-38).

Regarding claim 20 Mole teaches an integrated circuit (see col. 3, lines 65-67 and col. 4, lines 1-2).

Regarding claim 27 Ripley, King, and Mole teach a device as recited in claim 8 and is rejected given the same reasoning as above.

Regarding claim 38 Ripley, King, and Mole teach a device as recited in claim 8 and is rejected given the same reasoning as above.

Applicant's arguments with respect to claims 1-40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abbasi U.S Patent No. 6,397,051 discloses dual image-reject mixer receiver for multiple channel reception and processing.

Sokoler U.S Patent No. 6,073,001 discloses down conversion mixer.

Ben-Efraim U.S Patent No. 5,812,927 discloses a system and method for correction of I/Q angular error in a satellite receiver.

Weinert U.S Patent No. 5,067,140 discloses conversion of analog signal into I and Q digital signals with enhanced image rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandon J Miller whose telephone number is 703-305-4222. The examiner can normally be reached on Mon.-Fri. 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 703-308-5318. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

***

WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600